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Chemistry Final Exam Review Sheet #1

A.Problem Section - Be sure you show 1) the equation you will be using, 2) the numbers put in that equation with units, and 3) The answer.

1) What is the density of a substance that contains 23.8 grams in 14 ml?
2) A certain liquid has a density of, .879g/$cm^3$. What volume would be needed to obtain 50 grams of this liquid?
3) How much heat would be needed to raise the temperature of 40ml of water at 20 °C to the boiling point?
4) 500 cal of heat energy is added to a 3.54Kg of steel at 27°C. What is the final temperature of the steel? ( SHC Steel .11 cal/g°C )
5) How much heat would be needed to change 20 g of ice at -30°C into liquid at 50 °C? (Specific heat cap. of $H_2O$ solid, .5 cal/g°C - Heat of fusion 80 cal/g)
6) What is the % composition by mass of each element in the compound Ferric carbonate dihydrate?
7) A compound with a molecular weight of 380 g/mole is 47.37 % carbon, 10.53 % hydrogen and 42.11 % oxygen. Find the empirical and molecular formula.
8) 20 grams of cobalt is reacted with excess sulfuric acid in a single replacement reaction. How many grams of each product are produced in the reaction? What volume of 1 M sulfuric acid was used in the reaction?
9) 30 grams of $C_6H_6$ is burned in 120 g of oxygen. How many grams of each product is produced? If any reactant remains unreacted, which one is it and how many grams are left over?

B. Equations – Write and balance the following equations.
   1. Composition of silver bromide from elements.
   2. Decomposition of ammonium sulfite into elements.
   3. Double replacement between stannous arsenate and lithium nitride.
   4. Single replacement between barium oxide and phosphorous.
   5. Single replacement between lead oxalate and sodium.
   6. Combustion of $C_6H_{13}OH$.

C. Questions
   1. Name 8 physical properties of matter.
   2. In terms of density, describe when one substance will float on another.
   3. What is the limiting reagent in a chemical reaction.
   4. Put two objects together that have the same mass. One has a temperature of 20 °C and the other is 40 °C. Will the temperature end up at 30 °C when equilibrium is reached? Explain.

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1. How much heat would be needed to change 50 ml of water from 20 C to the boiling point?
2. If 5000 cal of heat energy is added to 100 g of steel (.1cal/gC) at 20 C what will the final temperature be?
3. How much energy would be needed to vaporize 200 g of water at its boiling point. (Heat of vap. 540 cal/g)
4. How much will 400 ml of lead weigh if its density is 11.7g/ml?
5. What is the volume of 100 pounds of mercury that has a density of 13.5 g/ml? (454g = 1 pound)
6. What is the % composition by mass of each element in calcium bicarbonate?
7. A compound with a molecular weight of 380 g/mole contains 47.37% carbon, 10.53% hydrogen, and 42.11 % oxygen by mass. Find the empirical and molecular formulas.
8. How many grams of sodium sulfate would be needed to produce 50 grams of silver sulfate in a double replacement reaction with silver acetate?
9. 30 grams of the compound in #7 is burned in 100 g of oxygen. How many grams of each product is formed? If any reactant remains unreacted, which one is it and how many grams are left over?

Advanced Final Exam Topics(multiple choice and problems)

1. scientific method. what is an experiment

2 thru 12 metric system, prefixes, conversions, percent error

13 thru 24 matter: density, physical and chemical properties and changes, compounds, elements, homogeneous and heterogeneous.

25 and 26 energy: $Q = m \Delta T C_p$

27 thru 38 atoms: parts of the atom, know the experiments and the scientists' names and who worked on the atom

39 thru 55 chemical formulas: charges, how to write formulas, how to name formulas, how to find the mass of an element or compound

56 thru 64 mathematics of chemical formulas: formula mass, changing grams to moles or molecules or atoms, percent composition.

65 thru 77 chemical equations: balancing equations, and types of equations: single, double, comp, and decomp.

78 thru 84 mathematics of chemical equations: mol-mol ratios, volume-volume problems, mass-volume problems, and mass-mass problems.

85 thru 94 periodic table: know the charges of the groups, group names, where metalloids, metals and nonmetals are located, the diatomic and polyatomic molecules and name them.

95 thru 100 electron configuration: orbitals, s, p, d, f. know the number of orbitals, the number of maximum electrons in each, and their location on the periodic table.

101 thru 111 chemical bonding: polar, nonpolar, and ionic bonds, properties of metals, nonmetals, and metalloids.

112 thru 120 gas laws: know Boyle's, Charles's, Mixed(Combined) laws and molar volume and their graphs.

121 thru 130 acids and bases: know the difference between acids, bases, and salts, their characteristics, some everyday examples of acids and bases in your house(food items), and pH scale and problems

problems: these you must show your work to get maximum credit

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